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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/654,967

09/05/2003

Masafumi Sakaguchi

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09/22/2004

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EXAMINER

SEVER, ANDREW T

ART UNIT

PAPER NUMBER

2851

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/654,967	SAKAGUCHI, MASAFUMI	
	Examiner	Art Unit	
	Andrew T Sever	2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-12, 14 and 15 is/are rejected.
- 7) ☒ Claim(s) 6 and 13 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/2003, 9/2003, 2/2004</u> | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 9-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Chambers et al. (US 5,626,410.)

Chambers teaches in figure 5 a transmissive screen applied to a rear projector, the transmissive screen comprising:

A light-guide plate having substantially cylindrical light-guide spaces arranged in a flat substrate (fiber optics 40); and

A light-exit-angle distribution uniformizing device (42) to make the angular distribution of the light exiting correspondingly from the substantially cylindrical light-guide spaces of the light-guide plate uniform over the transmissive screen, the light-exit-angle distribution uniformizing device being disposed at the light-exiting face side of the light-guide plate.

With regards to applicant's claim 9:

Chambers describes in the diffusing layer that haze value is greater in the center than in the peripheral region of the transmissive screen. (See column 3 lines 6-33.)

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With regards to applicant's claim 10:

Inherently the light-diffusing layer diffuses light at the surface.

With regards to applicant's claim 11:

The light-diffusing layer is disposed on the light-exiting face of the light-guide plate.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers as applied to claims 1 and 9-11 above, and further in view of Reidinger (US 4,743,090.)

As described in more detail above, Chambers teaches a transmissive screen applied to a rear projector, the transmissive screen comprising: a light-guide plate having substantially cylindrical light-guide spaces arranged in a flat substrate; and a light-exit-angle distribution uniformizing device to make the angular distribution of the light exiting correspondingly from the substantially cylindrical light-guide spaces of the light-guide plate uniform over the transmissive screen, the light-exit-angle distribution uniformizing device being disposed at the light-exiting face side of the light-guide plate.

Chambers specifically teaches that the light-guide spaces are fiber optics, however, Chambers does not specifically teach the specifications of said fiber optics or

the matrix surrounding them. Reidinger teaches a screen which uses fiber optics in figure 3. Reidinger teaches in column 2 lines 22-39, that the fiber optics (light guide spaces) have a diameter of 100 micro meters or more (which includes applicant's claimed range) and a length of 1 to 5 mm as is claimed in applicant's claim 3 (see column 2 lines 17-21.) Reidinger teaches in column 2 that the fibers are bound in a frame, which as shown in figure 1 is opaque (light guide is surrounded by an opaque region.) Reidinger teaches in column 1 lines 30-40 that this construction is superior over other prior art constructions of projection screens, in that it allows for easy cleaning, rearview projection, and improved light reflection. Since Reidinger's screen has these advantages and teaches the basic construction of a cylindrical light-guide based transmissive screen such as taught by Chambers, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the construction taught by Reidinger in the design and construction of the transmissive screen taught by Chambers.

5. Claims 5, 7, 8, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers as applied to claims 1 and 9-11 above, and further in view of Goldenberg et al. (US 6,327,083.)

As described in more detail above, Chambers teaches a transmissive screen applied to a rear projector, the transmissive screen comprising: a light-guide plate having substantially cylindrical light-guide spaces arranged in a flat substrate; and a light-exit-angle distribution uniformizing device to make the angular distribution of the light exiting correspondingly from the substantially cylindrical light-guide spaces of the light-

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guide plate uniform over the transmissive screen, the light-exit-angle distribution uniformizing device being disposed at the light-exiting face side of the light-guide plate.

Chambers does not teach the light-exit-angle distribution-uniformizing device includes a microlens array having microlens. Goldenberg teaches in figure 4 providing a lenticular surface (which is a term of art for a microlens array) as a light-exit-angle distribution-uniformizing device in a transmissive screen. Goldenberg teaches in column 1 line 56 through column 2 line 10 that the use of lenticular arrays for light-exit-angle distribution uniformizing in transmissive screens, especially rear projection type is well known in the art as this type of screen has high contrast, and high gain, accordingly it would have been obvious to one of ordinary skill in the art to use a microlens array to uniformize the light-exit-angle distribution.

With regards to applicant's claim 7:

The microlens array is disposed on the light-exiting face of the light-guide plate. (The office is considering part 49 of Goldenberg as being the disposition of the light guide plate of Chambers.)

With regards to applicant's claim 8:

Goldenberg teaches a light-diffusing layer (42) disposed on the light-exiting face of the microlens array.

With regards to applicant's claim 14:

Goldenberg teaches an alternative embodiment, where the light diffusing layer is a rough surface with substantially conical protrusions (see column 7 lines 55-67 and figure 12.)

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers as applied to claims 1 and 9-11 above, and further in view of Bourdelais et al. (US 2004/0028370)

As described in more detail above, Chambers teaches a transmissive screen applied to a rear projector, the transmissive screen comprising: a light-guide plate having substantially cylindrical light-guide spaces arranged in a flat substrate; and a light-exit-angle distribution uniformizing device to make the angular distribution of the light exiting correspondingly from the substantially cylindrical light-guide spaces of the light-guide plate uniform over the transmissive screen, the light-exit-angle distribution uniformizing device being disposed at the light-exiting face side of the light-guide plate.

Chambers teaches a light-diffusing layer, however, Chambers does not specify its haze value. Bourdelais teaches in paragraph 40 that it is beneficial in rear projection display devices to have a haze value between 20 and 60 percent, since this reduces unwanted moiré fringes. Accordingly it would have been obvious to use a light diffusing layer having a haze value in the range of 20 to 60 percent in the light diffusing layer of Chambers as taught by Bourdelais in order to reduce unwanted moiré fringes.

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7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers as applied to claims 1 and 9-11 above, and further in view of Haven (US 6,637,888.)

As described in more detail above, Chambers teaches a transmissive screen applied to a rear projector, the transmissive screen comprising: a light-guide plate having substantially cylindrical light-guide spaces arranged in a flat substrate; and a light-exit-angle distribution uniformizing device to make the angular distribution of the light exiting correspondingly from the substantially cylindrical light-guide spaces of the light-guide plate uniform over the transmissive screen, the light-exit-angle distribution uniformizing device being disposed at the light-exiting face side of the light-guide plate.

Although Chambers teaches a rear projection screen (see column 2 line 20), Chambers does not teach the well-known construction of a rear projector; Haven teaches such a construction for example in figure 1A. Rear projectors generally comprise of an optical projection unit (16), a light guide mirror (20 and 22), and a transmissive screen. Given the advantages of the transmissive screen of Chambers (uniform brightness over a wider field-of-view than prior rear projection screens see column 2 lines 20 and 21), it would be obvious to one of ordinary skill in the art at the time the invention was made to use the screen of Chambers in the rear projector of Haven.

Allowable Subject Matter

8. Claims 6 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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9. The following is a statement of reasons for the indication of allowable subject matter:

Claim 6 claims that refractive index of the micro lenses in the central region of the transmissive screen is greater than that in a peripheral region. Although it is known to use such a system in a individual lens or in a holographic lens system, it was not found in the prior art alone or in such a manner as to be combinable with Chambers to use such a system across a microlens array as claimed by applicant along with the limitations claimed in applicant's claim 1 of which claim 6 is dependent on.

Claim 13 claims a transmissive screen having a gloss value in the range of 5% to 40%. This was not found in the prior art.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

US 6,751,019 to DeSanto et al. teaches in figure 1 a projection screen that uses cylindrical wave guides.

US 6,421,181 to Yoshida et al. teaches in figures 2 micro-lenses in a transmissive screen.

US 6,519,400 to Biscardi et al. teaches in figure 2 light guides in a screen which are horizontal.

US 6,567,586 to Brophy et al. teaches individual lenses for a pair of fiber optics (see abstract).


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T Sever whose telephone number is 571-272-2128. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AS


JUDY NGUYEN
PRIMARY EXAMINER